

Purpose and Procedure

This is a result of a quick study of combinatorial background in central HIJING events with an sPHENIX TPC

The goal is to get an idea of what pion rejection factor is needed to measure Upsilon's

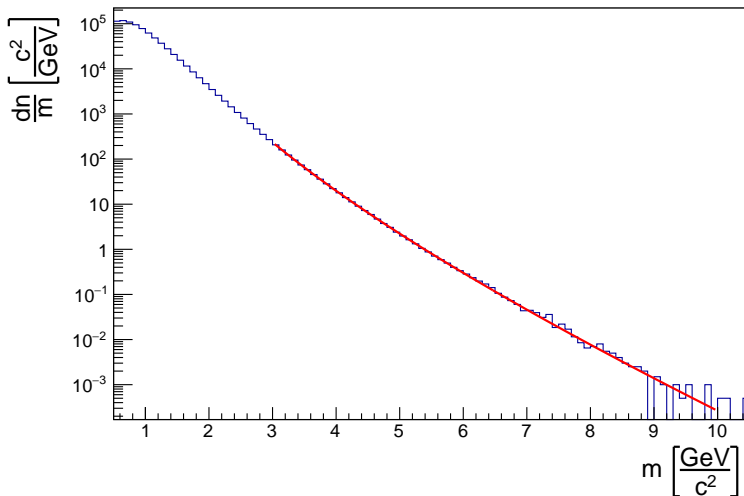
The TPC software has been updated as we spoke about last group meeting, but not with the full DSP simulation!

I only was able to get a few hundred events through condor : I think this is due to high memory usage. However, I mix every event with every other event

There are not many counts in the Upsilon region, but I can use an analytic fit through all mass

Mixed-event mass distribution

mixed event 0-10 % centrality

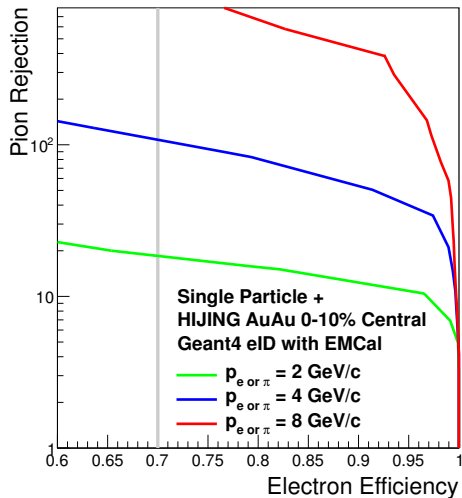


This is per-event normalized

If I integrate the fitted curve over a 3-sigma region around the Upsilon 3S mass, there are 1600 more combinatorial pairs per event than expected Upsilon 3S pairs. To get signal/background to one, we would then need a hadron rejection factor of 40 for typical Upsilon candidate tracks.

Looking closely at the sPHENIX proposal, there was already some work done (see plot on next slide). There are no details I can find anywhere. Mike says that Tony made the plot but Tony is on vacation. Mike also says that he remembers Tony saying that he did a HIJING study and concluded that pion rejection of 30 is a minimum requirement.

EID from the sPHENIX proposal



"The electron track candidate is identified using a two-dimensional likelihood analysis based on both EMCal and Inner HCal cluster energies"